```
Set      Items   Description
S1         194   S CBIR OR CBIRS OR CBVIR OR QBIC OR CONTENT()BASED()IMAGE()RETRIEVAL
S2      186230   S KEYWORD? ? OR KEY()WORD? ? OR TAG OR TAGS OR TAGGED OR TAGGING OR
S3     3822964   S CATEGORI?E? ? OR CATEGORI?ING OR CATEGORI?ATION? ? OR CATEGORY OR
S4       82598   S (TWO OR SECOND OR 2ND OR SECONDARY OR ANOTHER OR ADDITIONAL OR COU
S5       26152   S SUBCATEGORY OR SUBCATEGORIES OR SUBCLASS?? OR SUB()(S2 OR S3)
S6        1293   S (FINER OR GRANULAR? OR MORE()FINE ) (3N) (S2 OR S3)
S7       12036   S (S2 OR S3) (3N) (SUGGEST???? OR OPTION?? OR PROPOSE? ? OR PROPOSIN
S8           1   S S1 (30N) S7 (30N) (S4 OR S5 OR S6)
S9      289864   S STATISTIC? OR PROBABILITY OR PROBABILITIES OR LIKELIHOOD? ?
S10    7927704   S IMAGE? ? OR PICTURE? ? OR GRAPHIC?? OR PHOTO? ? OR PHOTOGRAPH? ? O
S11          7   S S9 (30N) S7 (30N) (S4 OR S5 OR S6) (30N) S10
S12          6   S S11 NOT S8
S13          6   IDPAT (sorted in duplicate/non-duplicate order)
S14          6   IDPAT (primary/non-duplicate records only)
; show files
```

[File 348] **EUROPEAN PATENTS** 1978-2007/ 200708
(c) 2007 European Patent Office. All rights reserved.
**File 348: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.*

[File 349] **PCT FULLTEXT** 1979-2007/UB=20070315UT=20070308
(c) 2007 WIPO/Thomson. All rights reserved.
**File 349: For important information about IPCR/8 and forthcoming changes to the IC= index, see HELP NEWSIPCR.*

[File 350] **Derwent WPIX** 1963-2006/UD=200719
(c) 2007 The Thomson Corporation. All rights reserved.
**File 350: DWPI has been enhanced to extend content and functionality of the database. For more info, visit http://www.dialog.com/dwpi/.*

8/5K/1 (Item 1 from file: 349) **Links**
PCT FULLTEXT

01092346
CONTENT-BASED IMAGE RETRIEVAL METHOD
PROCEDE D'EXTRACTION D'IMAGES FONDE SUR LE CONTENU

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	Country	Number	Kind	Date
Patent	WO	200415589	A1	20040219
Application	WO	2003CA1215		20030811

Priorities	CA	2397424		20020809

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)

[EP] AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES;
FI; FR; GB; GR; HU; IE; IT; LU; MC; NL;
PT; RO; SE; SI; SK; TR;

[OA] BF; BJ; CF; CG; CI; CM; GA; GN; GQ; GW;
ML; MR; NE; SN; TD; TG;

[AP] GH; GM; KE; LS; MW; MZ; SD; SL; SZ; TZ;
UG; ZM; ZW;

[EA] AM; AZ; BY; KG; KZ; MD; RU; TJ; TM;

Main International Patent Classes (Version 7):

IPC	Level
G06F-017/30	Main

Publication Language: English
Filing Language: English
Fulltext word count: 14344

English Abstract:

Although negative example can be highly useful to better understand the user's needs in content-based image retrieval, it was considered by few authors. A content-based image retrieval method according to the present invention addresses some issues related to the combination of positive and negative examples to perform a more efficient image retrieval. A relevance feedback approach that uses positive example to perform generalization and negative example to perform specialization is described herein. In this approach, a query containing both positive and negative example is processed in two general steps. The first general step considers positive example only in order to reduce the set of images participating in retrieval to a more homogeneous subset. Then, the second general step considers both positive and negative examples and acts on the images retained in the first step. Mathematically, relevance feedback is formulated as an optimization of intra and inter variances of positive and negative examples.

French Abstract:

Bien qu'un exemple negatif puisse etre tres utile pour mieux comprendre les besoins des utilisateurs dans un systeme d'extraction d'images fonde sur le contenu, celui-ci a ete rarement employe. La presente invention concerne un procede d'extraction d'images fonde sur le contenu qui aborde certains problemes lies a la combinaison d'exemples positifs et d'exemples negatifs pour obtenir une extraction d'images plus efficace. Une approche qui consiste a realiser un controle de pertinence utilisant un exemple positif pour effectuer une generalisation et un exemple negatif pour effectuer une particularisation est decrite. Dans cette approche, une requete contenant a la fois un exemple positif et un exemple negatif est traitee en deux etapes generales. La premiere etape generale consiste a prendre en compte uniquement l'exemple positif afin de reduire l'ensemble d'images objets de l'extraction a un sous-ensemble plus homogene. Ensuite, la seconde etape generale consiste a prendre en compte l'exemple positif et l'exemple negatif et a traiter les images retenues dans la premiere etape. D'un point de vue mathematique, le controle de pertinence est decrit comme une optimisation des variances intra et inter de l'exemple positif et de l'exemple

negatif.

Type	Pub. Date	Kind	Text
Publication	20040219	A1	With international search report.
Publication	20040219	A1	Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Detailed Description:

...process.

(0019] Vasconcelos et aL in "Learning from User Feedback in Image Retrieval Systems." in Neural Information Processing Systems 12, Denver, Colorado, 1999 disclose a **content-based image retrieval** methods involving negative example from the **second category**. More specifically, they **propose** a Bayesian model for image retrieval, operating on the assumption that the database is constituted of many image classes. When performing retrieval, image classes that...

14/5K/1 (Item 1 from file: 348) **Links**
EUROPEAN PATENTS

01843287

Automated system and method for harvesting and multi-stage screening of plant embryos
Automatishes System und Verfahren zum Ernten und mehrstufige Screening von Planzenembryonen
Systeme automatise et procede de recolte et criblage multi-etapes des embryons vegetaux

Patent Assignee:

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  (Applicant designated States: all)

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- **Superus-Lopez, Heather**
  1300 Pierce Place; Renton, Washington 98056; (US)

Legal Representative:

- **Bayliss, Geoffrey Cyril et al (28151)**
  BOULT WADE TENNANT, Verulam Gardens 70 Gray's Inn Road; London WC1X 8BT; (GB)

	Country	Number	Kind	Date	
Patent	EP	1498025	A2	20050119	(Basic)
	EP	1498025	A3	20050223	
Application	EP	2004253891		20040629	
Priorities	US	509070	P	20030630	

Designated States:
DE; FI; FR; SE;

Extended Designated States:
AL; HR; LT; LV; MK;

International Patent Class (V7): A01G-009/10; A01H-004/00; C12N-005/04; G01N-015/00

Abstract EP 1498025 A3

A method and system for automatically harvesting and screening plant embryos in multiple stages to identify those embryos that are suited for incorporation into manufactured seeds are provided. The method includes generally three steps. First, plant embryos are carried by a conveyor (34) and are automatically sorted according to their rough size/shape and also singulated into discrete embryo units, for example by vibrational sieving. Second, the sorted and singulated plant embryos are transferred to a classification conveyor (34) and are classified using a first classification method. For example, each embryo may be imaged by a camera (38) and the image is used to ascertain the embryo's more precise size/shape. Third, for those embryos that have passed the first classification method, a second classification method is applied. For example, a pre-developed classification algorithm to classify embryos according to their putative germination vigor may be applied to the same image used in the first classification method, to identify those embryos that are likely to germinate and to remove the other from the conveyor (34) for example by a timed air/liquid jet (42).

Abstract Word Count: 181
NOTE: 1
NOTE: Figure number on first page: 1

Legal Status

Type	Pub. Date	Kind	Text
Application:	20050119	A2	Published application without search report
Examination:	20050119	A2	Date of request for examination: 20040710
Search Report:	20050223	A3	Separate publication of the search report

Language

Publication: English
Procedural: English
Application: English

Fulltext Availability

Available Text	Language	Update	Word Count
CLAIMS A	(English)	200503	1054
SPEC A	(English)	200503	7733
Total Word Count (Document A) 8787			
Total Word Count (Document B) 0			
Total Word Count (All Documents) 8787			

Specification: ...subsequent classification stage. Second, the sorted and singulated plant embryos are classified using a first classification method. For example, each of the embryos may be **imaged** by a camera and the **image** is used to ascertain the embryo's size/shape. Those embryos within a predefined size/shape range are considered to have passed the first classification... ...embryos desirable for incorporation into manufactured seeds. For example, a pre-developed classification algorithm to classify embryos according to their putative germination vigor (i.e., **likelihood** of successful germination) may be applied to the same **image** used in the first size/shape classification method, to identify those embryos that are likely to germinate. The embryos that have passed both the first and **second classification** methods are identified as suitable for incorporation into manufactured seeds.

According to one aspect, the first and **second classification** methods are carried out along a classification conveyor belt while the sorted and singulated embryos are transported thereon. In some classification methods, it is preferred that the embryos are generally arranged in a single file on the classification conveyor belt. Various means for achieving the single file configuration are **proposed**. For example, the **classification** conveyor belt may be arranged generally perpendicularly to the porous conveyor belt on which the embryos are sorted and singulated. According to this configuration, the...

14/5K/4 (Item 4 from file: 349) **Links**
PCT FULLTEXT

01351034

HIERARCHICAL MEDICAL IMAGE VIEW DETERMINATION
DETERMINATION DE VUE D'IMAGE MEDICALE HIERARCHIQUE

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  (Designated only for: US)
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Legal Representative:

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	Country	Number	Kind	Date
Patent	WO	200634366	A1	20060330
Application	WO	2005US33876		20050921
Priorities	US	2004611865		20040921

Designated States: (All protection types applied unless otherwise stated - for applications 2004+)
AE; AG; AL; AM; AT; AU; AZ; BA; BB; BG;
BR; BW; BY; BZ; CA; CH; CN; CO; CR; CU;
CZ; DE; DK; DM; DZ; EC; EE; EG; ES; FI;
GB; GD; GE; GH; GM; HR; HU; ID; IL; IN;
IS; JP; KE; KG; KM; KP; KR; KZ; LC; LK;
LR; LS; LT; LU; LV; LY; MA; MD; MG; MK;
MN; MW; MX; MZ; NA; NG; NI; NO; NZ; OM;
PG; PH; PL; PT; RO; RU; SC; SD; SE; SG;
SK; SL; SM; SY; TJ; TM; TN; TR; TT; TZ;
UA; UG; US; UZ; VC; VN; YU; ZA; ZM; ZW;

[EP] AT; BE; BG; CH; CY; CZ; DE; DK; EE; ES;
FI; FR; GB; GR; HU; IE; IS; IT; LT; LU;
LV; MC; NL; PL; PT; RO; SE; SI; SK; TR;

[OA] BF; BJ; CF; CG; CI; CM; GA; GN; GQ; GW;
ML; MR; NE; SN; TD; TG;

[AP] BW; GH; GM; KE; LS; MW; MZ; NA; SD; SL;
SZ; TZ; UG; ZM; ZW;

[EA] AM; AZ; BY; KG; KZ; MD; RU; TJ; TM;

International Patent Classes (Version 8/R)

IPC	Level	Value	Position	Status	Version	Action	Source	Office
G06K-0009/68	A	I	F	B	20060101		H	EP
G06T-0007/00	A	I	L	B	20060101		H	EP

Language

Publication Language: English
Filing Language: English
Fulltext word count: 10820

English Abstract:

A cardiac view of a medical ultrasound image is automatically identified (24, 26, 28). By grouping different views into sub-categories, a hierarchal classifier identifies the views. For example, apical views are distinguished (24) from parasternal views. Specific types of apical or parasternal views are identified (26, 28) based on distinguishing between images of the geneses. Different features are used for classifying, such as gradients, functions of the gradients, statistics of an average frame of data from a clip or sequence of frames, or a number of edges along a given direction. The number of features used may be compressed (22), such as by classifying a plurality of features into a new feature. For example, alpha weights in a model of features and classes are determined and used as features for classification

French Abstract:

L'invention concerne une vue cardiaque d'une image a ultrasons medicale automatiquement identifiee (24, 26, 28). Par groupage des differentes vues en sous-categories, un classificateur hierarchique identifie les vues. Par exemple, des vues apicales sont distinguees (24) des vues parasternales. Les types specifiques de vues apicales ou parasternales sont identifies (26, 28) sur la base de la distinction entre les images de geneses. Les caracteristiques differentes sont utilisees afin de classifier, notamment des gradients, des fonctions de gradients, des statistiques d'une trame de donnees moyenne a partir d'un clip ou d'une sequence de trame, et un certain nombre de bords le long d'une direction donnee. Le nombre de caracteristiques utilisees peut etre comprime (22), notamment par classification de plusieurs caracteristiques en une nouvelle. Par exemple, les poids alpha dans un modele de caracteristiques et de classes sont determines et utilises en tant que caracteristiques de classification.

Legal Status

Type	Pub. Date	Kind	Text
Publication	20060330	A1	With international search report.
Publication	20060330	A1	Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Detailed Description:

...cava, suprastemal north long axis of the aorta, and suprasternal notch short axis of the aortic arch. To assist diagnosis, the views of cardiac ultrasound **images** are automatically classified. The view may be unknown, such as associated with a random transducer position or other not specifically defined view.

4
[0021] A... ...classifier classifies an unknown view as either apical, parasternal, subcostal, unknown or supracostal view, and then further classifies the view into one of the respective **subclasses** where the view is not unknown. Rather than one versus all or one versus one schemes to identify a class (e.g., distinguishing between from... ...fewer number of classes at each level). By separating the classification, specific views may be more accurately identified. A specific view in any of the **sub-classes** may include an "unknown view" option, such as A2C, A4C and unknown **options** for apical **sub-class**. Single four or fifteen-class identification may be used in other embodiments.

[00221 Identification is a function of any combination of one or more features.

For example, identification is a function of gradients, gradient functions, number of edges, or **statistics** of a frame of data averaged from a sequence of **images**. Features used for classification, whether for view identification or diagnosis based on a view, may be generated by compressing information in other

features.

[00231 The classification outputs an absolute identification or a confidence or **likelihood** measure that the identified view is in a particular class. The results of view identification for a medical **image** can be used by other automated methods, such as abnormality detection, quality assessment methods, or other applications that provide automated diagnosis or therapy planning. The...

```
Set     Items   Description
S1       6406   S CBIR OR CBIRS OR CBVIR OR QBIC OR CONTENT()BASED()IMAGE()RETRIEVAL OR
CONTENT()BASED()VISUAL()INFORMATION()RETRIEVAL OR QUERY()BY()IMAGE()CONTENT
S2      53706   S KEYWORD? ? OR KEY()WORD? ?
S3     165727   S TAG OR TAGS OR TAGGED OR TAGGING OR METADATA OR META()DATA OR METATAG?
S4    3495074   S CATEGORI?E? ? OR CATEGORI?ING OR CATEGORI?ATION? ? OR CATEGORY OR
CATEGORIES OR CLASSIFY OR CLASSIFIED OR CLASSIFYING OR CLASSIFICATION? ? OR CLASS OR
CLASSES
S5      62529   S (S2 OR S3 OR S4) (3N) (SUGGEST???? OR OPTION?? OR PROPOSE? ? OR
PROPOSING OR PROPOSAL? ? OR RECOMMEND??? OR RECOMMENDATION? ? OR COMMEND??? OR
COMMENDATION? ? )
S6     157580   S (TWO OR SECOND OR 2ND OR SECONDARY OR ANOTHER OR ADDITIONAL OR COUPLE OR
PAIR OR BOTH) (3W) (S2 OR S3 OR S4)
S7       1173   S (S2 OR S3 OR S4) (3N) (FINER OR GRANULAR? OR MORE()FINE )
S8      62198   S SUBCATEGORY OR SUBCATEGORIES OR SUBCLASS?? OR SUB()(S2 OR S3 OR S4)
S9         12   S S1 AND S5 AND (S6 OR S7 OR S8)
S10         6   S S9 NOT PY>2003
S11         2   RD  (unique items)
S12     84592   S (S2 OR S3 OR S4) (5N) (HIERARCHY OR HIERARCHICAL OR HIERARCHIES OR
LEVEL? ? OR TREE OR TREES OR BTREE? ? OR MULTILEVEL? OR SUBDIRECTOR? OR SUBLEVEL? )
S13        14   S S1 AND S5 AND S12
S14         7   S S13 NOT PY>2003
S15         6   S S14 NOT S11
S16         6   RD  (unique items)
S17   3978462   S STATISTIC? OR PROBABILITY OR PROBABILITIES OR LIKELIHOOD? ? OR METRICS
S18   4800153   S IMAGE? ? OR PICTURE? ? OR GRAPHIC?? OR PHOTO? ? OR PHOTOGRAPH? ? OR
PAINTING? ? OR DRAWING? ? OR ART
S19       335   S S17 AND S5 AND (S6 OR S7 OR S8 OR S12) AND S18
S20    210130   S GUI OR GUIS OR UI OR USER()INTERFACE? OR WIMP OR
WINDOW()ICON()MENU()POINTER()INTERFACE? ?
S21         5   S S19 AND S20
S22         5   S S21 NOT (S11 OR S16)
S23         5   S S22 NOT PY>2003
S24         2   RD  (unique items)
S25      1111   S (TWO OR SECOND OR 2ND OR SECONDARY OR ANOTHER OR ADDITIONAL OR COUPLE OR
PAIR OR BOTH OR EITHER ) (3W) S2
S26        18   S S2 (3N) (FINER OR GRANULAR? OR MORE()FINE )
S27       957   S S2 (5N) (HIERARCHY OR HIERARCHICAL OR HIERARCHIES OR LEVEL? ? OR TREE OR
TREES OR BTREE? ? OR MULTILEVEL? OR SUBDIRECTOR? OR SUBLEVEL? )
S28         2   S SUB()S2
S29         8   S S17 AND S5 AND (S25 OR S26 OR S27 OR S28) AND S18
S30         8   S S29 NOT (S11 OR S16 OR S24)
S31         0   S S30 NOT PY>2003
 ; show files
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[File 8] **Ei Compendex(R)** 1884-2007/Mar W1

[File 35] **Dissertation Abs Online** 1861-2007/Feb

[File 65] **Inside Conferences** 1993-2007/Mar 21

[File 2] **INSPEC** 1898-2007/Mar W2

[File 94] **JICST-EPlus** 1985-2007/Mar W4

**File 94: JICST will be removed from all vendors on March 31, 2007. Please contact the Knowledge Center for alternative files.*

[File 111] **TGG Natl.Newspaper Index(SM)** 1979-2007/Mar 16

[File 6] **NTIS** 1964-2007/Mar W3

[File 144] **Pascal** 1973-2007/Mar W2

[File 434] **SciSearch(R) Cited Ref Sci** 1974-1989/Dec

[File 34] **SciSearch(R) Cited Ref Sci** 1990-2007/Mar W2

[File 62] **SPIN(R)** 1975-2007/Mar W1

[File 99] **Wilson Appl. Sci & Tech Abs** 1983-2007/Feb

[File 95] **TEME-Technology & Management** 1989-2007/Mar W3

[File 56] **Computer and Information Systems Abstracts** 1966-2007/Mar

[File 57] **Electronics & Communications Abstracts** 1966-2007/Mar

[File 60] **ANTE: Abstracts in New Tech & Engineer** 1966-2007/Mar

[File 266] **FEDRIP** 2007/Feb

[File 438] **Library Lit. & Info. Science** 1984-2007/Feb

[File 239] **Mathsci** 1940-2007/Apr

[File 248] **PIRA** 1975-2007/Feb W4

11/5/1 (Item 1 from file: 8) **Links**
Fulltext available through: ScienceDirect
Ei Compendex(R)

11383054 **E.I. No:** EIP06491029101
Title: A classification framework for content-based image retrieval

Author: Aksoy, Selim; Haralick, Robert M.
Corporate Source: Insightful Corporation, Seattle, WA 98109-3044
Source: Proceedings - International Conference on Pattern Recognition v 16 n 2 2002.
Publication Year: 2002
CODEN: PICREG **ISSN:** 1051-4651
Language: English
Document Type: JA; (Journal Article) **Treatment:** T; (Theoretical); X; (Experimental)
Journal Announcement: 0612W3
Abstract: A challenging problem in image retrieval is the combination of multiple features and similarity models. We pose the retrieval problem in a **two**-level **classification** framework with **two classes**: the relevance **class** and the irrelevance class of the query. The first level maps high-dimensional feature spaces to two-dimensional probability spaces. The second level uses combinations of simple linear classifiers trained in these multiple probability spaces to compensate for errors in modeling probabilities in feature spaces. Similarity is computed using joint posterior probability ratios instead of the common way of computing distances in feature spaces and taking their weighted combinations. Experiments on two groundtruthed databases show that the **proposed classification** framework performs significantly better than the common geometric framework of distances and allows a well-defined and effective way of combining multiple features and similarity measures. copy 2002 IEEE. 11 Refs.
Descriptors: *Content based retrieval; Classification (of information); Problem solving; Feature extraction; Query languages; Conformal mapping; Probability
Identifiers: Retrieval problem; Classification framework; Ground truthed databases; Posterior probability
Classification Codes:
723.1.1 (Computer Programming Languages)
723.2 (Data Processing); 716.1 (Information & Communication Theory); 723.4 (Artificial Intelligence); 723.5 (Computer Applications); 723.1 (Computer Programming); 922.1 (Probability Theory)
723 (Computer Software, Data Handling & Applications); 716 (Electronic Equipment, Radar, Radio & Television); 921 (Applied Mathematics); 922 (Statistical Methods)
72 (COMPUTERS & DATA PROCESSING); 71 (ELECTRONICS & COMMUNICATION ENGINEERING); 92 (ENGINEERING MATHEMATICS)

11/5/2 (Item 2 from file: 8) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
Ei Compendex(R)

09631940 **E.I. No:** EIP03487757810
Title: Multi-class relevance feedback content-based image retrieval

Author: Peng, Jing
Corporate Source: Department of Electrical Engineering Tulane University, New Orleans, LA 70118, United States
Source: Computer Vision and Image Understanding v 90 n 1 April 2003. p 42-67
Publication Year: 2003
CODEN: CVIUF4 **ISSN:** 1077-3142
Language: English
Document Type: JA; (Journal Article) **Treatment:** T; (Theoretical)
Journal Announcement: 0312W1
Abstract: Relevance feedback methods for content-based image retrieval have shown promise in a variety of image database applications. These techniques assume two-class relevance feedback: relevant and irrelevant classes. While simple computationally, two-class relevance feedback often becomes inadequate in providing sufficient information to help rapidly improve retrieval performance. In this paper we propose a multi-class form of relevance feedback retrieval to try to exploit multi-class information. For a given query, we use a Chi **2 analysis to determine the local relevance of each feature dimension with multi-class relevance feedback. This information is then used to customize the retrieval metric to rank images. By exploiting multi-class information, our method is able to create flexible metrics that better capture user perceived similarity. In a number of image data sets, the method achieves a higher level of precision with fewer iterations, demonstrating the potential for substantial improvements over two-**class** relevance feedback retrieval. copy 2003 Elsevier Science (USA). All rights reserved. 48 Refs.
Descriptors: *Content based retrieval; Computer vision; Database systems; Vectors; Feedback
Identifiers: Multi-class relevance feedback
Classification Codes:
723.2 (Data Processing); 723.5 (Computer Applications); 741.2 (Vision); 723.3 (Database Systems); 921.1 (Algebra)
723 (Computer Software, Data Handling & Applications); 741 (Light, Optics & Optical Devices); 921 (Applied Mathematics)
72 (COMPUTERS & DATA PROCESSING); 74 (LIGHT & OPTICAL TECHNOLOGY) ; 92 (ENGINEERING MATHEMATICS)

16/5/1 (Item 1 from file: 8) **Links**

Fulltext available through: SPIE - The International Society of Optical Engineering USPTO Full Text Retrieval Options

Ei Compendex(R)

08823372 **E.I. No:** EIP01226522782

Title: A hierarchical content-based image retrieval approach

Author: Xiong, X.; Chan, K.L.

Corporate Source: Sch. of Elec. and Electron. Eng. Nanyang Technological University, Singapore 639798, Singapore

Conference Title: Storage and Retrieval for Media Databases 2001

Conference Location: San Jose,CA, United States **Conference Date:** 20010124-20010126

Sponsor: SPIE

E.I. Conference No.: 58038

Source: Proceedings of SPIE - The International Society for Optical Engineering v 4315 2001. p 437-448

Publication Year: 2001

CODEN: PSISDG **ISSN:** 0277-786X

Language: English

Document Type: CA; (Conference Article) **Treatment:** T; (Theoretical)

Journal Announcement: 0106W1

Abstract: In this paper, **Content-Based Image Retrieval** from a Hierarchically organized database (HCBIR) is proposed. Images in the database are categorized into different classes based on human perception. The characteristics of each class is represented by the prototypes extracted from images in the class by using the Unsupervised Optimal Fuzzy Clustering (UOFC) algorithm. Based on the **proposed** Image-**Class** Matching Distance (ICMD), a modification of the Earth Mover's Distance (EMD), the relevant class of the query image can be selected. The rank of candidate images is determined in the descending order of similarity, and a class with the most number of high ranking images is then selected. The search domain is narrowed down and the retrieval efficiency is improved greatly. A comparison is done between HCBIR approach and nonhierarchical **CBIR** (NHCBIR) approach. It can be concluded that the HCBIR approach is believed more similar to the process of human vision, and more efficient. 26 Refs.

Descriptors: *Bibliographic retrieval systems; Image processing; Database systems; Feature extraction; Algorithms; Fuzzy sets; Pattern matching; Image retrieval

Identifiers: Image **classification**; **Hierarchical content based image retrieval**; Unsupervised optimal fuzzy clustering; Image-class matching distance

Classification Codes:

903.3 (Information Retrieval & Use); 723.2 (Data Processing); 723.3 (Database Systems); 723.5 (Computer Applications); 921.4 (Combinatorial Mathematics, Includes Graph Theory, Set Theory)

903 (Information Science); 723 (Computer Software, Data Handling & Applications); 921 (Applied Mathematics)

90 (ENGINEERING, GENERAL); 72 (COMPUTERS & DATA PROCESSING); 92 (ENGINEERING MATHEMATICS)

16/5/2 (Item 1 from file: 35) **Links**
Dissertation Abs Online

01873820 ORDER NO: AADAA-I3043628
Recognition of partially occluded objects in content-based image retrieval

Author: Cho, June-Suh
Degree: Ph.D.
Year: 2002
Corporate Source/Institution: Rutgers The State University of New Jersey - Newark (0461)
Directors: Nabil R. Adam; Vijay Atluri
Source: Volume 6302B of Dissertations Abstracts International.
PAGE 872 . 139 PAGES
Descriptors: COMPUTER SCIENCE
Descriptor Codes: 0984
ISBN: 0-493-57509-X

Electronic Commerce has propelled the growth of buying and selling of a variety of products through the Internet. Often, the electronic catalogs contain pictures comprising of images of these products, either shown exclusively or combined with other products. Despite substantial research, facilitating search of an object based on the content of an image still remains as a major challenge. This problem of **content-based image retrieval** is even more difficult when multiple objects are present in an image or when they are partially occluded. While the main focus is on the recognition of partially occluded objects, in this dissertation, we make several contributions to the area of **content-based image retrieval**.

First, we have proposed feature extraction methods to support **content- based image retrieval** based on individual objects in images. We have employed rotational invariants using Run Length Code lines to extract shape parameters, and texture and shape features to retrieve parameterized image parameters such as roundness, form factor, aspect ratio, surface regularity, angle of second moment, entropy, contrast, and mean. RLC lines can be directly calculated for area and position measurements with less arithmetic than pixel array techniques. RLC lines can distinctly represent shape parameters, which are better discriminating features than parameters such as color and texture for recognizing image objects in electronic catalogs.

Second, we have **proposed** an object **classification** method, called Probability Interval Classification (PIC), using novel splitting rules, which are based on minimizing the sum of variance and maximizing the difference of probabilities of intervals. The splitting rules are given by considering the probabilities of pre-assigned intervals for covariates rather than exhaustively searching over all possible splitting values. It provides the user with control of the accuracy of the tree by adjusting the number of intervals. The results show that PIC is more stable than the exhaustive search method when the learning sample changes, produce better accuracy with reasonable tree size and depth, and demonstrates higher precision and recall scores.

Third, we have developed methods to reconstruct and estimate partially occluded shapes and regions of objects in images from overlapping and cutting. We have presented two robust methods for recognizing partially occluded objects based on symmetry properties. One is based on the contours of objects, and the other is based on individual parts of objects. Our methods have provided simple techniques to reconstruct occluded regions via a region copy using the symmetry axis within an object. Based on the estimated parameters for partially occluded objects, we have performed object recognition on the **classification tree**. Since our method relies on reconstruction of the object based on the symmetry rather than statistical estimates, it has proven to be remarkably robust in recognizing partially occluded objects in the presence of scale changes, rotation, and viewpoint changes.

16/5/3 (Item 2 from file: 35) **Links**
Dissertation Abs Online

01747269 ORDER NO: AADAA-I9972009
Semantic classification in image databases

Author: Vailaya, Aditya
Degree: Ph.D.
Year: 2000
Corporate Source/Institution: Michigan State University (0128)
Adviser: Anil K. Jain
Source: Volume 6105B of Dissertations Abstracts International.
PAGE 2628 . 195 PAGES
Descriptors: COMPUTER SCIENCE ; INFORMATION SCIENCE
Descriptor Codes: 0984; 0723
ISBN: 0-599-77240-9

Due to the huge amount of potentially interesting documents available over the Internet, searching for relevant information has become very difficult. Since image and video are a major source of these data, grouping images into (semantically) meaningful **categories** using low-**level** visual features is an important (and challenging) problem in **content -based image retrieval**. Using Bayesian classifiers, we attempt to capture high-level concepts from low-level image features. Specifically, we have developed Bayesian classifiers for semantic image classification (indoor vs. outdoor, city vs. landscape, and sunset vs. forest vs. mountain), image orientation detection, and object detection (detecting regions of sky and vegetation in outdoor images). We demonstrate that a small codebook (the optimal codebook size is selected using a modified MDL criterion) extracted from a learning vector quantizer can be used to estimate the class-conditional densities of the observed features needed for image classification. We have developed an incremental learning paradigm, a feature selection scheme, a rejection scheme, and a classifier combination strategy using bagging to improve classifier performance. Empirical results on a large database (∼24,000 images) show that semantic categorization and organization of the database using the **proposed classification** schemes improves both retrieval accuracy and efficiency.

16/5/4 (Item 1 from file: 2) **Links**
INSPEC

08603302 **INSPEC Abstract Number:** B2003-06-6135-018, C2003-06-6160S-003
Title: An image database semantically structured based on automatic image annotation for content-based image retrieval
Author Xuejian Xiong; Kap Luk Chan; Lei Wang
Author Affiliation: Sch. of Electr. & Electron. Eng., Nanyang Technol. Univ., Singapore, Singapore
Conference Title: Proceedings of the Fifth Asian Conference on Computer Vision **Part** vol.1 p. 87-92 vol.1
Editor(s): Suter, D.; Bab-Hadiashar, A.
Publisher: Asian Federation of Computer Vision Soc , Clayton, Vic., Australia
Publication Date: 2002 **Country of Publication:** Australia 2 vol.(xxxii+x+917) pp.
ISBN: 0 9580256 0 6 **Material Identity Number:** XX-2002-00694
Conference Title: Proceedings of Asian Conference on Computer Vision
Conference Date: 22-25 Jan. 2002 **Conference Location:** Melbourn, Vic., Australia
Medium: Also available on CD-ROM in PDF format

Language: English **Document Type:** Conference Paper (PA)
Treatment: Applications (A); Theoretical (T)
Abstract: In this paper, we presented a semantically structured image database for **content-based image retrieval**. A **class** descriptor is **proposed** to represent each **class** using a multi-prototype model, which can be obtained by using a learning scheme, such as the Unsupervised Optimal Fuzzy Clustering algorithm, on a group of sample images manually selected from the **class**. Based on the **proposed** Image-**Class** Matching Distance, a similarity measure at the semantic **level** between an image and **classes**, images can be annotated by tokens of classes. Hence, composite features of images, including low-level descriptors, clays descriptors, and image annotation, are stored into a structured feature database corresponding to the semantically structured image database. From experiments, it can be concluded that the performance of the semantically structured **CBIR** system is improved greatly in terms of retrieval time and efficiency. (15 Refs)
Subfile: B C
Descriptors: content-based retrieval; image representation; image retrieval; visual databases
Identifiers: content-based image retrieval; content-based retrieval; image retrieval; semantically structured; image database; **CBIR**; retrieval time; retrieval efficiency; composite features; low-level descriptors; clays descriptors; image annotation; learning scheme ; unsupervised optimal fuzzy clustering; similarity measure; image-class matching distance
Class Codes: B6135 (Optical, image and video signal processing); C6160S (Spatial and pictorial databases); C5260B (Computer vision and image processing techniques); C7250R (Information retrieval techniques)

16/5/5 (Item 2 from file: 2) **Links**
INSPEC

08474692 **INSPEC Abstract Number:** B2003-01-6135-340, C2003-01-5260B-531
Title: A classification framework for content-based image retrieval
Author Aksoy, S.; Haralick, R.M.
Author Affiliation: Insightful Corp., Seattle, WA, USA
Conference Title: Proceedings 16th International Conference on Pattern Recognition **Part** vol.2 p. 503-6 vol.2
Editor(s): Kasturi, R.; Laurendeau, D.; Suen, C.
Publisher: IEEE Comput. Soc , Los Alamitos, CA, USA
Publication Date: 2002 **Country of Publication:** USA 4 vol.(xxix+834+xxxv+1116+xxxiii+1068+xxv+418) pp.
ISBN: 0 7695 1695 X **Material Identity Number:** XX-2002-02682
U.S. Copyright Clearance Center Code: 1051-4651/02/$17.00
Conference Title: Proceedings of 16th International Conference on Pattern Recognition
Conference Date: 11-15 Aug. 2002 **Conference Location:** Quebec City, Que., Canada

Language: English **Document Type:** Conference Paper (PA)
Treatment: Applications (A); Practical (P)
Abstract: A challenging problem in image retrieval is the combination of multiple features and similarity models. We pose the retrieval problem in a two- **level classification** framework with two **classes**: the relevance class and the irrelevance **class** of the query. The first **level** maps high-dimensional feature spaces to two-dimensional probability spaces. The second level uses combinations of simple linear classifiers trained in these multiple probability spaces to compensate for errors in modeling probabilities in feature spaces. Similarity is computed using joint posterior probability ratios instead of the common way of computing distances in feature spaces and taking their weighted combinations. Experiments on two groundtruthed databases show that the **proposed classification** framework performs significantly better than the common geometric framework of distances and allows a well-defined and effective way of combining multiple features and similarity measures. (11 Refs)
Subfile: B C
Descriptors: content-based retrieval; image classification; image retrieval
Identifiers: classification framework; **content-based image retrieval**; multiple features; similarity models; two-**level classification** framework; relevance class; high-dimensional feature spaces; two-dimensional probability spaces
Class Codes: B6135 (Optical, image and video signal processing); C5260B (Computer vision and image processing techniques); C1250M (Image recognition); C6160S (Spatial and pictorial databases)

16/5/6 (Item 1 from file: 94) **Links**
Fulltext available through: USPTO Full Text Retrieval Options
JICST-EPlus

04579576 **JICST Accession Number:** 00A0277667 **File Segment:** JICST-E
Hierarchical Classification Method for Overviewing Huge Amount of Image Contents. Making a Catalogue of Images.
KUSHIMA KAZUHIKO (1); SATO MICHIE (1); AKAMA HIROKI (1); YAMAMURO MASASHI (1)
(1) Nippon Telegraph and Telephone Corp. (NTT), Cyber Space Lab., JPN
Joho Shori Gakkai Ronbunshi (Transactions of Information Processing Society of Japan) , 2000 , VOL.41,NO.SIG1(TOD5) , PAGE.54-63 , FIG.12, TBL.2, REF.18
Journal Number: Z0778AAZ **ISSN:** 0387-5806
Universal Decimal Classification: 681.3:061.68 681.3:621.397.3 002.5:005
Language: Japanese **Country of Publication:** Japan
Document Type: Journal
Article Type: Original paper
Media Type: Printed Publication
Abstract: In order to overview huge amount of image contents efficiently, the **hierarchical classification** method is **proposed**. The method is characterized by the combination of a template-based classification and an automatic clustering, each of which is based on the image features. A classification support environment is implemented, which treats several image features as classification viewpoints. According to the constructed **classification tree**, the images are displayed on the electronic book-called the CyberBook-by the means similar to the catalogue. It helps finding desired images. The experimental results reveals that the number of referred images for a finding target image is reduced by 25% compared with the case of **content-based image retrieval**. (author abst.)
Descriptors: binary image; reading(library); classification; image database; cataloging; information retrieval; clustering; color image; color; tree(graph)
Broader Descriptors: image; action and behavior; database; work and operation; information arrangement technique; documentation; information management; management; retrieval; modification; subgraph; graph
Classification Codes: JD03030U; JE04010I; AC06020S

24/5/1 (Item 1 from file: 35) **Links**
Dissertation Abs Online

01253305 ORDER NO: AAD92-35464

GEOLOGIC MAPPING FROM DIGITAL DATA ON A PERSONAL WORKSTATION (IMAGE PROCESSING)

Author: PAPACHARALAMPOS, DEMETRIOS
Degree: PH.D.
Year: 1992
Corporate Source/Institution: UNIVERSITY OF GEORGIA (0077)
Director: GEORGE S. KOCH, JR.
Source: Volume 5307B of Dissertations Abstracts International.
PAGE 3370 . 132 PAGES
Descriptors: GEOLOGY; REMOTE SENSING
Descriptor Codes: 0372; 0799

This study introduces techniques for compiling a geologic map on a personal workstation. An **image** GIS database with information relevant to rock-type identification was formed by combining digital **image**, **image**-derived, and non-**image** data. Interactive **image** enhancement techniques, ranging from contrast, brightness, and sharpness adjustments, to B/W **image** colorization are implemented with an easy to understand **user interface**. Scanned aerial **photograph** examples illustrate the increased interpretability potential using these techniques. **Statistical** and absolute methods for deriving geological measurements from digital **images** and DEMs, including strike, dip and stratigraphic thickness are presented along with implementation flow diagrams. A unique approach to classification is introduced. In addition to the **image** spectral bands, **image** -derived layers of band ratios and color hues are incorporated, along with non-**image** data in an **image** GIS database. Rock-types are **classified** in terms of certainty **levels** using modified parallelepiped and distance classifiers, to improve efficiency. A temporary information stack with a scoreboard holds the intermediate results. A rule-based expert system procedural step, is used to generalize the intermediate results and assign the pixels to their appropriate classes. Comprehensive examples illustrate the **proposed classification** approach and compare it with traditional methods.

24/5/2 (Item 1 from file: 2) **Links**
Fulltext available through: ACM - Association for Computing Machinery USPTO Full Text Retrieval Options
INSPEC

08107997 **INSPEC Abstract Number:** C2002-01-4250-009
Title: Data mining with optimized two-dimensional association rules
Author Fukuda, T.; Morimoto, Y.; Morishita, S.; Tokuyama, T.
Author Affiliation: Tokyo Research Laboratory, IBM, Japan
Journal: ACM Transactions on Database Systems vol.26, no.2 p. 179-213
Publisher: ACM ,
Publication Date: June 2001 **Country of Publication:** USA
CODEN: ATDSD3 **ISSN:** 0362-5915
SICI: 0362-5915(200106)26:2L.179:DMWO;1-E
Material Identity Number: A316-2001-005
U.S. Copyright Clearance Center Code: 0362-5915/01/0600-0179$5.00

Language: English **Document Type:** Journal Paper (JP)
Treatment: Theoretical (T)
Abstract: We discuss data mining based on association rules for two numeric attributes and one Boolean attribute. For example, in a database of bank customers, "Age" and "Balance" are two numeric attributes, and "CardLoan" is a Boolean attribute. Taking the pair (Age, Balance) as a point in two-dimensional space, we consider an association rule of the form ((Age, Balance) in P) implies (CardLoan=Yes), which implies that bank customers whose ages and balances fall within a planar region P tend to take out credit card loans with a high **probability**. We consider **two classes** of regions, rectangles and admissible (i.e., connected and x-monotone) regions. For each **class**, we **propose** efficient algorithms for computing the regions that give optimal association rules for gain, support, and confidence, respectively. We have implemented the algorithms for admissible regions as well as several advanced functions based on them in our data mining system named SONAR (System for Optimized Numeric Association Rules), where the rules are visualized by using a **graphic user interface** to make it easy for users to gain an intuitive understanding of rules. (35 Refs)
Subfile: C
Descriptors: computational complexity; data mining; knowledge based systems; relational databases
Identifiers: data mining; association rules; optimal association rules; SONAR; **graphic user interface**; convex hull searching; **image** segmentation; matrix searching; database universal relation
Class Codes: C4250 (Database theory); C4240C (Computational complexity); C6160D (Relational databases); C6170K (Knowledge engineering techniques)